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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,282	02/24/2004	Shin-Tson Wu	UCF-388	2414
7590	05/09/2006		EXAMINER	
Law Offices of Brian S. Steinberger 101 Brevard Avenue Cocoa, FL 32922				CALEY, MICHAEL H
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

WL

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/786,282	WU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Michael H. Caley	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 01 March 2006.

2a) This action is **FINAL**.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,3-13 and 15-24 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1,3-13 and 15-24 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 24 February 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/1/06 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (U.S. Patent No. 6,680,769 “Lee”) in view of Arakawa et al. (U.S. Patent No. 6,400,433 “Arakawa”).**

Regarding claim 1, Lee discloses a flower-shaped vertical alignment structure liquid crystal display with fast response, high contrast ratio and wide view angle comprising: a first substrate (Figure 4J element 31) with a protrusion shaped electrode (Figure 4J element 13) as the pixel electrode on an interior surface of the first substrate;

a second substrate with a common electrode on an interior surface of the second substrate (Figure 4J elements 33 and 17); aligning layers formed on the first and second substrates (Column 7 lines 28-35); liquid crystal materials (Column 2 line 18) filling a space between the first and second substrates as a liquid crystal cell; and a first polarizer disposed on an exterior surface of the first substrate (Column 6 lines 59-65); and a polarizer on an exterior surface of the second substrate (Column 6 lines 59-65), wherein a polarized light produced by the first and second polarizers is used as a light source so that the liquid crystal display operates in a transmissive mode.

Lees fails to disclose circular polarizers as each formed of a linear polarizer and wide band quarter-wave film. Arakawa, however, teaches a circular polarizer as advantageously comprising a linear polarizer and a wide-band quarter wave film so that light may be uniformly polarized across visible wavelengths of light (abstract, Column 3 lines 1-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the circular polarizer from a linear polarizer and wide band quarter wave film as proposed. One would have been motivated to form the circular polarizer accordingly such that uniform polarization may occur across the visible range of light as is preferred in a color liquid crystal display as disclosed by Ozawa (Arakawa: Column 1 lines 12-32).

Lee further fails to explicitly disclose the alignment layers as providing vertical alignment. Nakanishi, however, teaches vertical alignment as advantageous in an electrode structure similar to that disclosed by Lee as having an improved viewing angle characteristic (Column 1 lines 31-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the alignment layers to provide vertical alignment. One would have been motivated to provide vertical alignment to the liquid crystal layer to benefit from an improved viewing angle characteristic.

It is noted that the term “flower-shaped” does not provide specific guidance as to a particular shape. Accordingly, the term flower-shaped vertical alignment” does not distinguish beyond the term “vertical alignment”.

Regarding claim 4, Lee discloses the aligning layer as a polymer (Column 7 lines 28-35).

Regarding claim 5, Lee discloses the aligning layer as an inorganic material (Column 7 line 33).

Regarding claim 6, Lee discloses the pixel electrode as having a column-like shape (Figure 4J element 13).

Regarding claim 7, Lee discloses the pixel electrode as including an indium tin oxide layer (Column 5 line 64).

Regarding claim 8, Lee discloses the shape of the empty hole as a square (Figure 5A element 51).

Regarding claim 9, Lee discloses the common electrode as including an ITO layer in the areas surrounding the empty hole (Column 6 line 12).

Regarding claim 10, Lee fails to disclose wall-bump protrusions on the ITO layer. Nakanishi, however, teaches such protrusions (element 66) as advantageous to more strongly determine the aligning direction of the liquid crystal (Column 10 lines 25-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the wall-bump protrusions to provide vertical alignment. One would have been motivated to provide protrusions to the liquid crystal layer to benefit from an improved viewing angle characteristic (Column 1 lines 31-36).

Regarding claim 11, Lee discloses the liquid crystal materials as having a positive dielectric anisotropy (Column 2 lines 23-24).

Regarding claim 12, Lee discloses the liquid crystal materials as having a negative dielectric anisotropy (Column 2 lines 23-24).

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Arakawa and Nakanishi and in further view of Shimoshikiryō (U.S. Patent No. 6,850,301).**

Lee as modified by Arakawa and Nakanishi discloses all of the proposed limitations except for the hole as having a hexagon shape. Shimoshikiryō, however, teaches a hexagon shaped holes as an alternative to a square, circle, or other polygon, due to their ability to be closely arranged on an electrode and their ability to produce a more axially symmetrical orientation (Column 31 line 66 – Column 32 line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the hole disclosed by Lee to have a hexagon shape. One would have been motivated to use a hexagon shape as an alternative to a rectangular shape due to its ability to produce a more axially symmetric orientation (Column 31 line 66 – Column 32 line 10).

**Claims 13 and 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Nakanishi.**

Lee discloses all of the proposed limitations except for the alignment layers as providing vertical alignment. Nakanishi, however, teaches vertical alignment as advantageous in an electrode structure similar to that disclosed by Lee as having an improved viewing angle characteristic (Column 1 lines 31-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the alignment layers to provide vertical alignment. One would have been motivated to provide vertical alignment to the liquid crystal layer to benefit from an improved viewing angle characteristic.

It is noted that the term “flower-shaped” does not provide specific guidance as to a particular shape. Accordingly, the term flower-shaped vertical alignment” does not distinguish beyond the term “vertical alignment”.

Regarding claim 16, Lee discloses the aligning layer as a polymer (Column 7 lines 28-35).

Regarding claim 17, Lee discloses the aligning layer as an inorganic material (Column 7 line 33).

Regarding claim 18, Lee discloses the pixel electrode as having a column-like shape (Figure 4J element 13).

Regarding claim 19, Lee discloses the pixel electrode as including an indium tin oxide layer (Column 5 line 64).

Regarding claim 20, Lee discloses the shape of the empty hole as a square (Figure 5A element 51).

Regarding claim 21, Lee discloses the common electrode as including an ITO layer in the areas surrounding the empty hole (Column 6 line 12).

Regarding claim 22, Lee fails to disclose wall-bump protrusions on the ITO layer.

Nakanishi, however, teaches such protrusions (element 66) as advantageous to more strongly determine the aligning direction of the liquid crystal (Column 10 lines 25-27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the wall-bump protrusions to provide vertical alignment. One would have been motivated to provide protrusions to the liquid crystal layer to benefit from an improved viewing angle characteristic (Column 1 lines 31-36).

Regarding claim 23, Lee discloses the liquid crystal materials as having a positive dielectric anisotropy (Column 2 lines 23-24).

Regarding claim 24, Lee discloses the liquid crystal materials as having a negative dielectric anisotropy (Column 2 lines 23-24).

**Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Nakanishi and in further view of Shimoshikiryō.**

Lee as modified by Arakawa discloses all of the proposed limitations except for the hole as having a hexagon shape. Shimoshikiryō, however, teaches a hexagon shaped holes as an alternative to a square, circle, or other polygon, due to their ability to be closely arranged on an electrode and their ability to produce a more axially symmetrical orientation (Column 31 line 66 – Column 32 line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the hole disclosed by Lee to have a hexagon shape. One would have been motivated to use a hexagon shape as an alternative to a rectangular shape due to its ability to produce a more axially symmetric orientation (Column 31 line 66 – Column 32 line 10).

***Response to Arguments***

Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael H. Caley  
May 5, 2006

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